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10. THE DIET OF THE NICOBAR MEGAPODE *MEGAPODIUS NICOBARIENSIS*, IN GREAT NICOBAR ISLAND

The Nicobar Megapode *Megapodius nicobariensis*, a mound nesting bird, is endemic to Nicobar Islands. Megapodes are a unique group of birds as they utilise external sources of heat to incubate their eggs (Jones *et al.* 1995). They forage by scratching and raking the debris on the ground (Jones *et al.* 1995). Different types of food items have been reported, including both plant and animal matter (Cleland 1912; Booth 1986). Leaf-litter invertebrates and seeds are the major food items of megapodes (Gill 1970; Brookes 1919), but in captivity they consume mice, tadpoles and snails (Coles 1937). Stomach contents of a Nicobar Megapode specimen from Tillanchong contained a beetle *Scarabus plicatus* and a snail *Helicina zelebori* (Ali and Ripley 1983). Detailed information on the diet of the mound building Nicobar Megapode has not been published so far. Hence, the diet of a population of the Nicobar Megapode *Megapodius nicobariensis* at the Great Nicobar Island was studied.

This study was carried out from December 1995 to May 1998 at the southern tip of the Great Nicobar I. (6° 76' to 6° 79' N, 93° 81' to 93° 84' E). The study area was a narrow strip of forest, between 40 and 300 m wide, bound by the beach to the east and by wetlands or forests to the west. The foraging megapodes were intensively observed from hides constructed at four different places, following focal animal sampling (Altmann 1974). Apart from this, the diet of the Nicobar Megapode was analysed from gut samples of three dead specimens that were acquired from tribals. The gut contents were identified and then grouped. The stomach contents of two dead chicks were also examined.

A plastic tube of 4 mm diameter, attached to a 500 ml plastic bottle filled with saline, was moistened with saline solution for lubrication and inserted into the mouth of the bird. The bird was then inverted over a plastic cup, so that as the fluid was forced into its stomach, the excess fluid plus the stomach contents flowed into the cup (Hess 1997). Five megapode stomachs were flushed by this method. After the flushing, the birds were seen resuming their activities without any abnormal behaviour, showing that this method was not stressful to the birds. The preference rank of each food item consumed by the Nicobar Megapode was arrived at by both the Volumetric and Occurrence Method (Kennedy and Fitzmaurize 1972).

The Nicobar Megapode was observed eating soil invertebrates, flying insects and vegetable matter. The stomach contents reveal that the primary food items of the Nicobar Megapode were cockroaches, beetles, ants, lizards, snails, grasshoppers, hermit crabs, seeds of *Macaranga peltata* and rotten vegetable matter. One bird was observed chasing an agamid lizard on the ground. Megapodes have also been observed feeding on the tissue of dead red crabs.

Seeds of *Macaranga peltata* dominated among the stomach contents of this species (Table 1). Cockroaches and snails were the major animal food items. Some beetles in the megapode diet were *Anomala andamanica*, *A. rhodomela*, *A. varicolor*, *Alissonotum piceum*, *Parastasia luteola*, *Heteronechus lioderes*, *Rhyssemus germanus*, *Aphodius moestus*, *Holotrichia nicobarica*, *Apogonia nicobarica*, and *Dasyvalgus insularis*. These megapodes were also seen consuming centipedes, lepidopterans, termites and tadpoles. Like many other birds, they ingested grit in order to help break down their food. They were occasionally observed drinking rainwater. Of the stomachs of the two dead chicks that were analyzed, one chick, which was partially eaten by a hermit crab, contained only the seeds of *Macaranga peltata* in its stomach. Another chick that was most likely attacked by a raptor, contained nothing in its stomach.

Table 1: The diet and its preference by the Nicobar Megapode

Food item	Rank based on Volumetric proportion	Rank based on frequency of occurrence
Macaranga peltata	1	1
Dictyoptera (cockroaches)	2	2
Snails	2	3
Litters	3	2
Beetles	4	4
Ants	4	4
Unidentified	4	3
Grasshopper	4	5
Pauropodans	5	5
Hermit crab	5	5
Reptile scale	6	6

Like other megapodes, the Nicobar Megapode also forages by scratching and raking the debris on the ground. More precipitation reduced the foraging activities of the Nicobar Megapode (Spearman correlation test: $r_s = -0.46$, $p = 0.05$). Foraging patterns varied significantly between the years (Kruskal Wallis test: $H = 9.23$, $df = 2$, $p < 0.01$), due to significant variation in precipitation (Kruskal Wallis test, $H = 7.81$, $df = 2$, $p = 0.02$). The data reported here agreed with other reports for the genus *Megapodius*: that they are omnivorous (Jones *et al.* 1995).

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11. GRIT USE IN THE SARUS CRANE *GRUS ANTIGONE*

Introduction

Grit is generally ingested by granivorous and herbivorous birds, and to a smaller extent by insectivorous birds (Weltry and Baptista 1988). The main purpose of grit intake by birds is to facilitate the mechanical grinding in the gizzard of any hard, coarse material ingested by the bird. However, grit may also provide calcium to female birds just before the breeding period (Harper 1964). Grit use patterns are fairly well understood for Galliformes (Dalke 1937; Sadler 1961) and for 'cornfield birds' (Best and Gionfriddo 1991; Gionfriddo and Best 1996). While several observations have been made towards ingestion of grit particles by Sarus Cranes (J. Langenberg *pers. comm.*, M. Nagendran *pers. comm.*, K.S.Gopi Sundar *pers. obs.*), no information exists on the amount and kind of grit ingested by Sarus Cranes. In this paper, we present information on grit use by the Sarus Crane in India based on contents of three Sarus Crane gizzards.

METHODS

The gizzards of three Sarus Cranes (one each of a sub-adult, male and female bird), which had been collected after their death due to suspected pesticide poisoning (S. Sharma, *pers. comm.*), were obtained from Keoladeo Ghana National Park in Bharatpur, India. The age of these birds were unknown